PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : F21V 21/04, 29/00, 25/00

A1

(11) International Publication Number: **WO 98/12472**

(43) International Publication Date: 26 March 1998 (26.03.98)

(21) International Application Number: PCT/GB97/02548

(22) International Filing Date: 19 September 1997 (19.09.97)

(30) Priority Data:
PCT/GB96/02293 20 September 1996 (20.09.96) WO
(34) Countries for which the regional or international application was filed: GB et al.

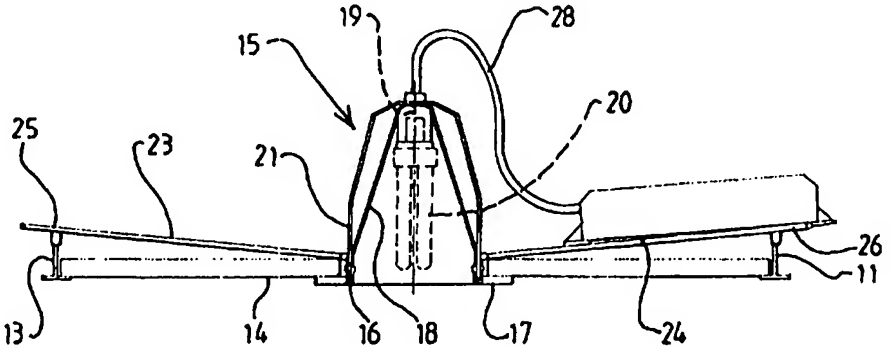
(71)(72) Applicant and Inventor: JONES, Peter, Charles [GB/GB]; Storrage House, Alvechurch, Worcestershire B48 7EP (GB).

(74) Agent: FORRESTER KETLEY & CO.; Chamberlain House, Paradise Place, Birmingham B3 3HP (GB).

(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

Published
With international search report.

(54) Title: INSTALLATION OF LIGHTING OR OTHER FITTINGS IN CEILINGS



(57) Abstract

A fitting such as a light fitting (15) in an opening in a panel (14) of a suspended ceiling has retaining means (22, 23, 24, 25, 26) which extends laterally from the fitting above the panel to engage the support structure (11, 13) of the ceiling.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon			PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

Title: INSTALLATION OF LIGHTING OR OTHER FITTINGS IN CEILINGS

Description of Invention

This invention relates to the installation of lighting or other fittings in ceilings, particularly but not exclusively suspended ceiling structures.

Suspended ceiling structures, sometimes called "false ceilings", are well known. They comprise a supporting structure which characteristically is suspended from a load bearing ceiling structure of a building (which may also be the floor structure in respect of the next storey of the building above the one in question). The supporting structure carries a number of panels which form the visible ceiling of the storey in question. The space above the suspended ceiling panels may be used for installation of services such as electrical wiring, heating and ventilation ducting, and the like. The ceiling panels commonly are in the form of slabs or sheets of a thermally insulating material, and may be held to their supporting structure by the use of some form of fasteners, e.g. clips.

A light fitting or a fitting for some other purpose may be installed in such a suspended ceiling by providing an aperture of appropriate size in one of the panels of the ceiling and fixing the fitting in such an aperture. The fitting may be held in place by clips or the like which engage the panel. In such an installation, the weight of the fitting is borne by the panel.

One requirement for suspended ceilings is that they should prevent penetration of heat, if a fire should start in a room space beneath the ceiling, to the space above the ceiling panels. This is because, although a storey of a building may be divided into individual room spaces by partitioning beneath

the suspended ceiling, the space above the suspended ceiling panels is not thus divided and the undivided ceiling space provides a route for rapid spread of fire in a building. If penetration of heat, by radiation or convection, through the suspended ceiling can be minimised, spread of fire can be delayed and accordingly applicable standards for fire resistance of suspended ceilings are expressed in terms of withstanding fire beneath the ceiling and limiting transmission of heat to a certain value for a certain period of time.

As above referred to, the panels of a suspended ceiling usually are of a material having thermally insulating properties and hence the performance under fire conditions of a ceiling is dependent upon the integrity of the panels being maintained. One possible mode of failure is that of collapse of the panels, and if a fitting such as a light fitting is supported in a panel then the weight of the fitting means that the panel is more likely to collapse. Thus, hitherto, the installation of light fittings in ceiling panels has caused the fire resistance thereof to be adversely affected. A similar problem exists in ceilings, other than suspended ceilings, in which light fittings are installed in panels eg of plasterboard: the weight of the fitting renders collapse of the ceiling more likely in the event of fire.

Accordingly it is an object of the present invention to overcome or reduce this disadvantage of known light fitting installations in ceilings especially suspended ceilings. Other objects and advantages of the invention will become apparent from the following description of the invention in general terms and in specific embodiments thereof.

According to one aspect of the invention, I provide a fitting with retaining means, adopted to be disposed in an opening in a ceiling panel and to be retained therein by the retaining means wherein the retaining means is adapted to engage the fitting and to extend laterally therefrom and to have supporting equipment with a member at a position spaced from void opening,

whereby a part of the panel adjacent said opening does not bear at least part of the weight of the fitting.

Whilst it would be within the broadest scope of the invention for the retaining means to be adapted to engage the panel itself at a position spaced from the fitting and the opening wherein it is disposed, thereby achieving a "load spreading" effect and so rendering the panel more resistant to collapse in a fire, preferably the retaining means is adapted to engage a supporting member or structure of the panel, so that it can assist in supporting the panel.

According to another aspect of the invention, I provide a fitting with retaining means, adapted to be disposed in an opening in a suspended ceiling panel and to be retained therein by the retaining means, which panel is supported at at least one edge by a support structure, wherein the retaining means is adapted to engage the fitting and extend laterally therefrom for engagement with said support structure of the panel.

According to yet another aspect of the invention, I provide a ceiling comprising a support structure; a ceiling panel which is supported by said support structure; a fitting disposed in an aperture in said panel, and a retaining means engaging the fitting and extending above the panel laterally from the fitting to engage the support structure.

Preferably the ceiling is a suspended ceiling with the panel being edge-supported by the support structure, whilst the retaining means engages the support structure at an edge of the panel.

Whilst it would be within the scope of the broadest invention for the retaining means to extend laterally in one direction to engage the support structure at a single point or region, preferably, however, the retaining means extends laterally from the fitting to engage the support structure at two or more spaced positions along the edges of a panel. Preferably it extends in directions generally opposite one another from the fitting.

In suspended ceiling installation in accordance with the invention, the weight of the fitting is at least partially, and preferably entirely, borne by the support structure of the suspended ceiling rather than by the panel in which the fitting is installed. Thereby the above described disadvantage of carrying the weight of the fitting by the panel, contributing to collapse of the panel in the event of fire, is substantially overcome. Indeed, the fitting can, if its weight is borne by the support structure, assist in supporting the panel and make it even less likely to collapse than if no fitting were present.

Preferably the fitting engages with the panel in such a manner as to support the panel in the region thereof adjacent the aperture in which the fitting is disposed. For example, the fitting may be provided with a flange extending beneath the panel.

The nature of the fitting may be such that it provides a barrier to heat transmission upwardly through it. However, if the fitting does not inherently provide such a barrier, or even if it does, there may be provided a heat shield member substantially enclosing a portion of the fitting which lies above the panel.

Such a heat shield member conveniently is of metal and may be a pressing or pressings of sheet metal, e.g. steel.

Preferably the heat shield member is provided with a covering of a material which, in the event of fire, acts as a thermally insulating barrier. Preferably such a covering is an intumescent coating, e.g. a suitable paint. Use of a suitable intumescent paint coating enables heat transmission to be resisted for a long time.

The fitting preferably comprises a portion defining a formation generally in the form of an annular groove, and the retaining means may then engage with said formation and extend outwardly therefrom to engage the support structure of the ceiling.

The retaining means may comprise a retaining member having a part-circular formation which may have snap-engagement with such an annular groove formation, and at least one limb extending from said part-circular formation to engage the support structure.

The retaining member may be of wire of sufficient rigidity to support the fitting and to have said engagement therewith.

According to yet another aspect of the invention, I provide a fitting having a heat shield member substantially enclosing a portion of the fitting which, when the fitting is installed in a ceiling panel, lies above the panel; the heat shield member comprising a covering of an intumescent material.

The invention will now be described by way of example with reference to the accompanying drawings, of which:-

Figures 1 and 2 are respectively a sectional and a plan view of a light fitting installed in a suspended ceiling, in accordance with the invention;

Figures 3 and 4 are partial sectional views through further embodiments of light fitting and showing the engagement of retaining members therewith;

Figures 5 to 7 are plan views showing light fittings and further possible configurations of retaining member engaging therewith;

Figures 8 and 9 are respectively a sectional elevation and an exploded perspective view of a further embodiment of light fitting and retaining member engaging therewith.

Referring firstly to Figures 1 and 2, these show, respectively in a sectional and a plan view, part of a suspended ceiling which comprises a support structure having members 10, 11, 12, 13 forming part of a grid structure of such members. The members 10, 12 are parallel to and spaced from one another while the members 11, 13 are also parallel to one another and spaced from one another, extending at right angles to the members 10, 12. The members 10 to 13 are of generally T-section metal members, and they are

supported in a manner which is conventional and well known for suspended ceilings from a load bearing ceiling/floor structure of a building. A ceiling panel supported by the support structure of members 10 to 13 is indicated at 14 and this is a sheet or slab of suitable material such as a mineral fibre material. The panel 14 rests on the facing lower flanges of the members 10 to 13 so that the panel is supported along its edges, and fastenings such as clips may be provided for fastening the panel in such a position.

A light fitting indicated generally at 15 is installed in a central aperture in the panel 14. The light fitting comprises a base 16 of annular form, and an annular flange 17 lies beneath the region of the panel 14 immediately surrounding the aperture therein. Upwardly from the base 16 there extends a generally conical reflector 18 which may be of metal, e.g. an aluminium alloy, and which at its upper end carries a lamp holder 19 for a lamp 20 which as illustrated is a low energy consumption lamp of compact fluorescent type.

Also extending upwardly from the base and externally of the reflector 18 is a heat shield member 21 which from the base 16 is initially cylindrical and then has a frusto-conical portion leading to a dished upper end at which it is closed apart from having an aperture to receive the lamp holder 19. The heat shield member 21 is of metal, e.g. steel, and is formed as a pressing or as a number of pressings secured together, and is covered with an intumescent paint coating which swells when subjected to temperatures above a pre-determined level to form a highly heat-resistant enclosure for the light fitting. Preferably the intumescent coating is on both inner and outer surfaces of the heat shield member.

Engaging the light fitting just above the panel 14 is a retaining means which in Figures 1 and 2 is a wire retaining member. The retaining member comprises a part-circular portion 22 which embraces the light fitting and holds the latter by virtue of having snap-engagement with an annular groove

formation on the light fitting. From the portion 22, two limb portions 23, 24 extend in opposite directions away from the light fitting and at their free ends the limbs 23, 24 are bent into U-shaped portions 25, 26 respectively. The portions 25, 26 overlie members 11, 13 and, by virtue of inherent resilience in the wire of which the retaining member is formed, bear down on the members 11, 13 so that substantially all the weight of the light fitting 15 is carried by these members. Also shown in the drawings is a choke unit 27 carried by the limb 24 of the retaining member and from which an electrical cable 28 extends to the lamp holder 19.

Figure 3 of the drawings shows in an enlarged view one possible mode of engagement of the retaining member as described above with the light fitting 15. In this figure, the annular base 16 of the light unit is shown and it will be noted that it has at its upper periphery an overturned lip 29 defining a downwardly facing annular groove receiving the portion 22 of the retaining member. Part of the reflector 18 and heat shield member 21 are shown, these being secured to the annular base 16 by a plurality of rivets 30 spaced circumferentially about the base. The flange 17 is actually provided at the lower edge of the reflector 18.

Referring now to Figure 4 of the drawings, this shows part of a light fitting which is of different design from that above described. In this embodiment, it comprises a base 40 with a flange 41, a reflector 42, and a heat shield 43 extending from an upper part of the base 40. The base 40 defines an outwardly facing annular groove 44 with which a retaining member 45 of the configuration above described engages.

Referring now to Figure 5 of the drawings, this shows a light fitting indicated generally at 50 and which may be as described above with reference to Figure 4. A retaining member 51 is provided which is of wire and comprises an elongate U-shaped portion 52 of sufficient length to extend from a light

fitting mounted in the centre of a suspended ceiling panel to engage the support structure at an edge of such panel. One limb 53 of the portion 52 is provided with a part circular portion 54 leading into a relatively short straight portion 55 at its free end. The other limb 56 of the portion 52 continues straight and, in its free state, parallel to the limb 53 and portion 55 to a free end portion at 57 which, as for the portion 52, is of sufficient length to engage a support structure of a ceiling panel.

An annular groove on a light fitting as 50 is engaged by the part-circular portion 54 and the opposed straight portion of the limb 56 of the retaining member. To hold the retaining member in engagement with the lighting fitting, a wire clip 58 is passed over the free end portion 57 and the portion 55 of the retaining member, to hold these portions against movement away from one another and thus against disengagement from the light fitting.

Figure 6 shows a modification of the embodiment of Figure 5, in which two wire retaining members 60, 61 are utilised, each having straight free end portions and a part-circular centre portion as indicated at 62, 63, respectively. The portions 62, 63 engage opposite sides of an annular groove provided on a light fitting, and the retaining members are held to one another by two clips 64, 65 disposed one to each side of the light fitting.

Figure 7 shows a light fitting which is provided with two retaining members 70, 71 each having straight free end portions and an intermediate part-circular (slightly more than semi-circular) portion as indicated at 72, 73. The portions 72, 73 are each able to have snap-engagement with an appropriate annular groove or grooves provided on a light fitting. Preferably such retaining members are disposed in such a way as to provide four-point support of the light fitting from the edge-supporting structure of a ceiling panel.

Referring now to Figures 8 and 9 of the drawings, these show a further embodiment of light fitting which is circular in plan view. It comprises a frontal

flange 110 from which a body portion 111 extends rearwardly, the body portion 111 affording an annular recess 112 with a base 113. Behind the portion 112, the body 111 has a portion 109 which extends inwardly followed by an annular rearwardly and outwardly extending portion 108 which defines a radially outwardly facing annular groove 107. The groove 107 provides for mounting of the light fitting in, for example, a panel in a suspended ceiling in the manner described hereafter.

The light fitting receives a dichroic lamp assembly indicated generally at 115. The lamp assembly 115 is supported in the light fitting by a mounting member 122 which has forwardly and outwardly oppositely extending arms 126 provided at its ends with respective pivot formations 130. The mounting member 122 further holds the lamp assembly 115, and a ceramic connector block 120 by which an electrical connection is established with the lamp assembly 115. Electrical cables 105 extend rearwardly from the connector block 120.

The assembly further comprises a cup shaped heat shield member 136. The heat shield member has a front rim portion 137 and a rear portion 138 defining an aperture through which the lamp and mounting member assembly extends. The rear portion 138 includes two opposed part-cylindrical formations which partly embrace the ceramic connector block 120 when the light fitting is assembled.

The heat shield member 136 has two oppositely disposed openings 139 through which the end parts of the arms 126, with the pivot formations 130 thereon, extend. The assembled condition of the light fitting, as shown in Figure 10 is reached by firstly fitting the mounting member and a lamp assembly to a heat shield member, and then fitting such sub-assembly rearwardly into the light fitting, resiliently deforming the arms 126 towards one another until their pivot formations 130 are able to snap into engagement with the base 113 of the recess 112 of the light fitting. Normally one of the pivot formations 130 would be thus engaged, followed by the other formation. The dimensions of the parts are such that when

such assembly has been carried out, the rear surface of the heat shield member 136 has contact with the light fitting in a substantially uninterrupted line in the annular region between the parts 109, 108 of the light fitting. By virtue of this, there is no or virtually no clear passage between the front and rear of the light fitting. The light fitting thus achieves a high fire safety rating for use in suspended ceilings or the like, by resisting heat transfer upwardly through the fitting.

The assembly of lamp and heat shield is able to tilt and rotate in the light fitting. Rotation through an angle of more than 180° may be prevented by providing pressed indentations 140 in the base 113 of the recess 112 in the light fitting, to be contacted by the formations 130 on arms 126. The front rim portion 137 of the heat shield member may be able to pass just beneath the edge of the flange 110 of the light fitting as shown in Figure 10, to provide a detent so that such a position of maximum tilting can be held in a vibration-resistant manner.

When the light fitting is to be installed in a suspended ceiling, an insulating washer as shown at 104 would be interposed between the flange 110 and a panel of such ceiling. The light fitting may be retained in such a panel by a retaining member 143 which as shown in Figure 11 may take the form of an elongate length of thick metal wire with a part-circular portion 144 which is able to be snap engaged, by resilient deformation, with the groove 107. The ends of the piece of wire take the form of limbs long enough to extend to rest upon the panel supports of the suspended ceiling, so that the weight of the light fitting is borne by the supports rather than the panel. A transformer or other low voltage electrical power supply for the halogen lamp assembly or an electrical connector block, may be carried by an end of the retaining member 143, as above described.

Alternatively a spring clip or clips may be used to retain the light fitting in a ceiling panel. One such clip may be used in conjunction with a retaining member having one limb only extending from a part-circular portion engaging the groove 107. Even if not required for retaining the light fitting in a panel, e.g. if two spring

clips are used, a retaining member engaging the groove 107 may be used to carry a transformer or a connector block.

The heat-insulating washer 104 could if desired be shaped to extend from the region of the flange 100 to overlie additionally the portions 111, 108 of the light fitting. If this is done, a further improvement in the fire safety rating of the light fitting is obtained, by preventing high temperatures being reached behind the fitting.

As illustrated, the light fitting shown in Figures 8 and 9 does not have an external heat shield member such as the heat shield member 21 illustrated in the embodiment of Figures 1 and 2. Such a heat shield member substantially enclosing the part of the light fitting which extends through an aperture in a ceiling panel above such panel may not be necessary because the light fitting by virtue of its internal construction does not provide a clear passage for heat to penetrate to the space above a ceiling panel. In addition, the light fitting utilising a dichroic halogen lamp assembly is inherently an extremely compact unit, and in any event does not provide a large path for heat penetration, as long as the ceiling panel does not collapse in the event of a fire. Since this latter possibility is unlikely to occur, by virtue of the arrangement of the retaining member of the light fitting and its engagement with the support structure of the suspended ceiling, a high fire safety rating is achieved. However, it would be possible, if desired, to provide an external heat shield member analogous to the heat shield member 21 having an intumescent coating.

In the above described embodiments, the fitting installed in the suspended ceiling is a light fitting. However, it will be appreciated that the principle of the retaining means used in the invention could also be applied to the installation of other fittings. By way of example, such other fittings could be loudspeakers, smoke detectors, or heating or ventilation fittings such as thermostats or even inlet/outlet fittings for ducting. In each case, the prevention of heat passage by way

of the fitting itself, and the support of the ceiling panel, provides a high fire safety rating.

In the above described embodiments, the retaining member engages the support structure of a suspended ceiling panel. However, the principle of utilising a retaining member extending laterally from a fitting to engage a member spaced from the fitting can provide for improved safety under fire conditions for other types of ceiling panel, eg a traditional plasterboard ceiling. To engage even the panel itself by a retaining member can provide a load-spreading effect and help to resist collapse of the panel in a fire.

The features disclosed in the foregoing description, or the accompanying drawing, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, may, separately or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

CLAIMS

1. A fitting with retaining means, the fitting being adapted to be disposed in an opening in a ceiling panel and to be retained therein by the retaining means, wherein the retaining means is adapted to engage the fitting and extend laterally therefrom and to have supporting engagement with a member at a position spaced from said opening, whereby a part of the panel adjacent said opening does not bear at least part of the weight of the fitting.

2. A fitting with retaining means, the fitting being adapted to be disposed in an opening in a suspended ceiling panel and to be retained therein by the retaining means, which panel is supported at at least one edge by a support structure wherein the retaining means is adapted to engage the fitting and extend laterally therefrom for engagement with said support structure of the panel.

3. A ceiling comprising a support structure; a ceiling panel supported by said support structure; a fitting disposed in an aperture in said panel; and a retaining means engaging the fitting and extending laterally from the fitting above the panel to engage a member at a position spaced from said opening, for supporting at least part of the weight of the fitting.

4. A ceiling according to claim 3 wherein said member is a part of the support structure for the panel.

5. A suspended ceiling comprising a support structure; a ceiling panel edge-supported by said support structure; a fitting disposed in an aperture in said panel; and a retaining means engaging the fitting and extending laterally

from the fitting above the panel to engage the support structure at an edge of the panel

6. A fitting or ceiling according to Claim 2 or Claim 5, wherein the retaining means extends laterally from the fitting to engage the support structure at at least two spaced positions along the edges of a panel.

7. A fitting or ceiling according to Claim 6 wherein the retaining means extends in directions generally opposite one another from the fitting.

8. A fitting or ceiling according to Claim 6 or Claim 7 wherein the weight of the fitting is adapted to be at least partially borne by the support structure.

9. A fitting or ceiling according to any one of the preceding claims wherein the fitting engages the panel to provide support for the latter in a region thereof adjacent the aperture wherein the fitting is disposed.

10. A fitting or ceiling according to Claim 9 wherein the fitting comprises a flange extending beneath the panel.

11. A fitting or ceiling according to any one of the preceding claims wherein the fitting provides a barrier to heat transmission upwardly through it.

12. A fitting or ceiling according to any one of the preceding claims further comprising a heat shield member substantially enclosing a portion of the fitting which lies above the panel.

13. A fitting or ceiling according to Claim 12 wherein said heat shield member is of metal.

14. A fitting or ceiling according to Claim 3 wherein said heat shield member is at least one pressing of sheet metal.

15. A fitting or ceiling according to any one of Claims 12 to 14 wherein the heat shield member has a covering of a material providing a thermally insulating barrier.

16. A fitting or ceiling according to Claim 15 wherein said covering is an intumescent coating.

17. A fitting or ceiling according to any one of the preceding claims wherein the fitting has a portion defining a formation generally in the form of an annular groove, the retaining means engaging said formation and extending outwardly therefrom to engage the support structure of the ceiling.

18. A fitting or ceiling according to Claim 17 wherein the retaining means comprises a retaining member having a part-circular formation engaging said annular groove formation, and at least one limb extending from said part-circular formation for engaging the support structure.

19. A fitting or ceiling according to any one of the preceding claims wherein the retaining means has snap engagement with the fitting.

20. A fitting or ceiling according to any one of Claims 17 to 19 wherein the retaining means or member is of wire.

21. A fitting or ceiling according to any one of the preceding claims, wherein the fitting is a light fitting.

22. In or for a suspended ceiling, a fitting with retaining means substantially as hereinbefore described with reference to the accompanying drawings.

23. A method of retaining a fitting in an opening in ceiling panel, comprising engaging the fitting by a retaining means which extends laterally therefrom to engage a member at a position spaced from said opening.

24. A method of retaining a fitting in an opening in a suspended ceiling panel, comprising engaging the fitting by a retaining means which extends laterally therefrom to engage a support structure by which the panel is edge supported.

25. A fitting having a heat shield member substantially enclosing a portion of the fitting which, when the fitting is installed in an opening in a ceiling panel, being above the panel; the heat shield member comprising a covering of an intumescent material.

26. Any novel feature or novel combination of features described herein and/or in the accompanying drawings.

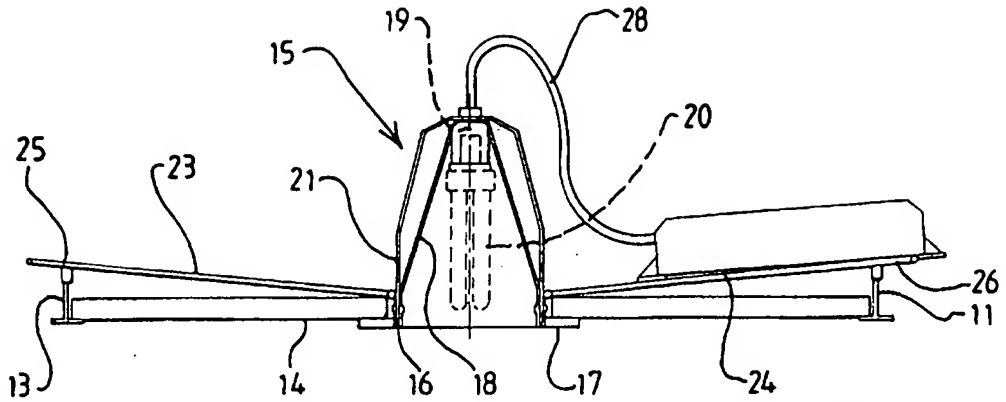

19
28
15
20
25
23
21
26
11
13
14
16
18
17
24

FIG 1

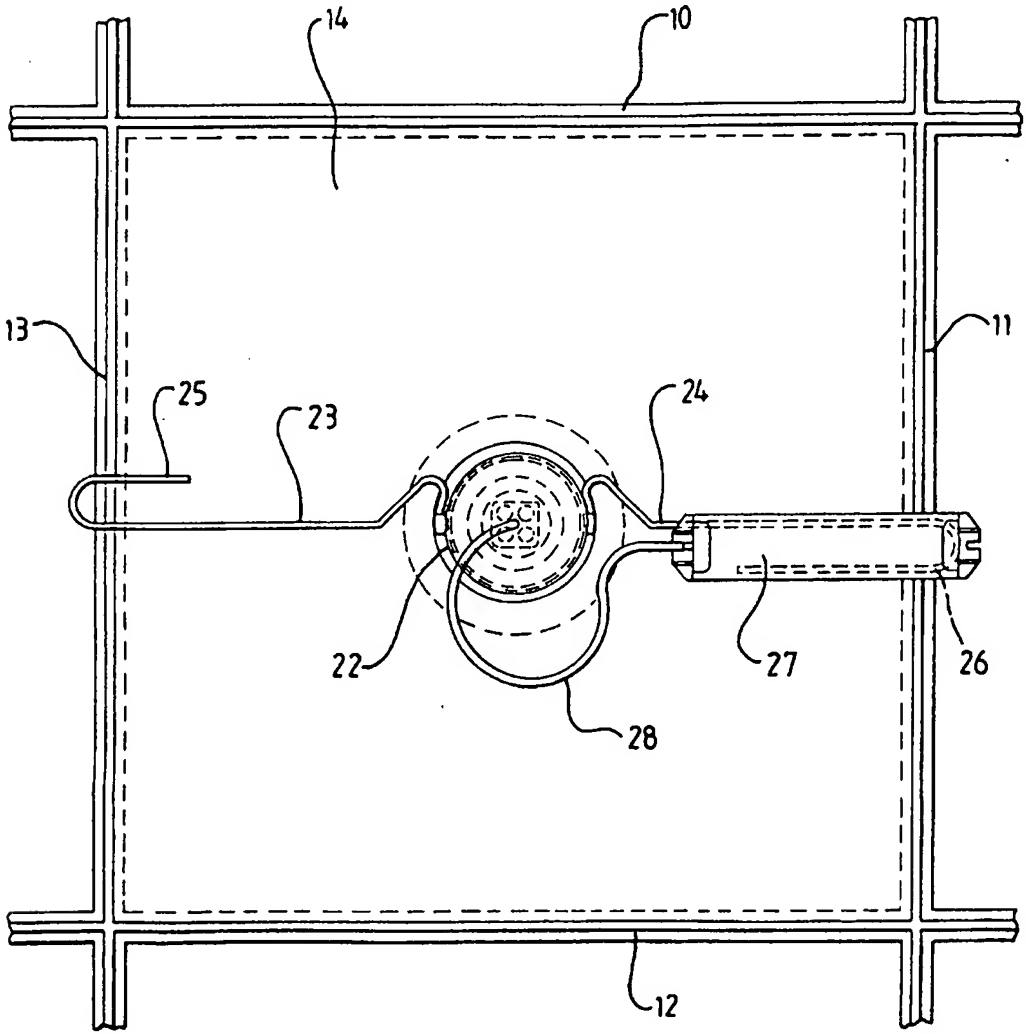

14
10
13
11
25
23
24
22
27
26
28
12

FIG 2

FIG 3

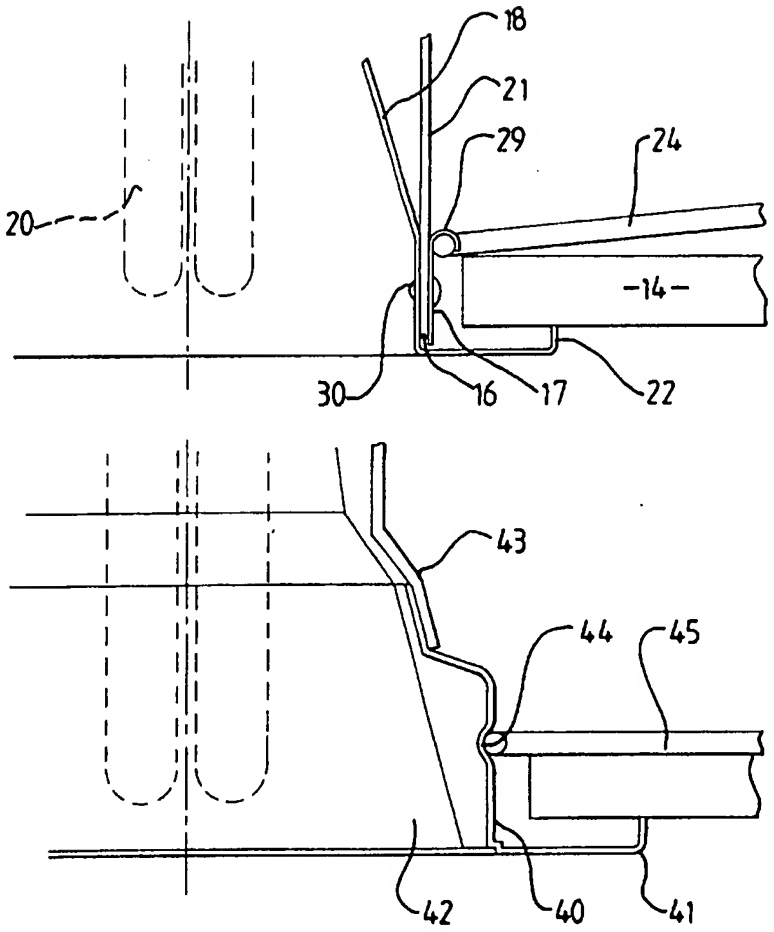


FIG 4

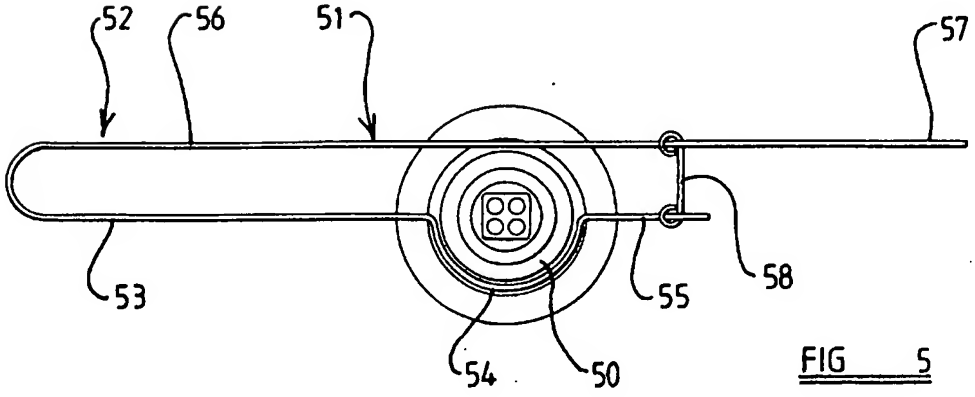


FIG 5

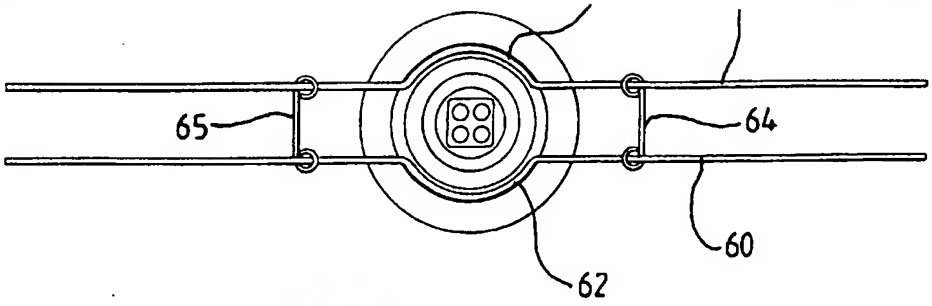
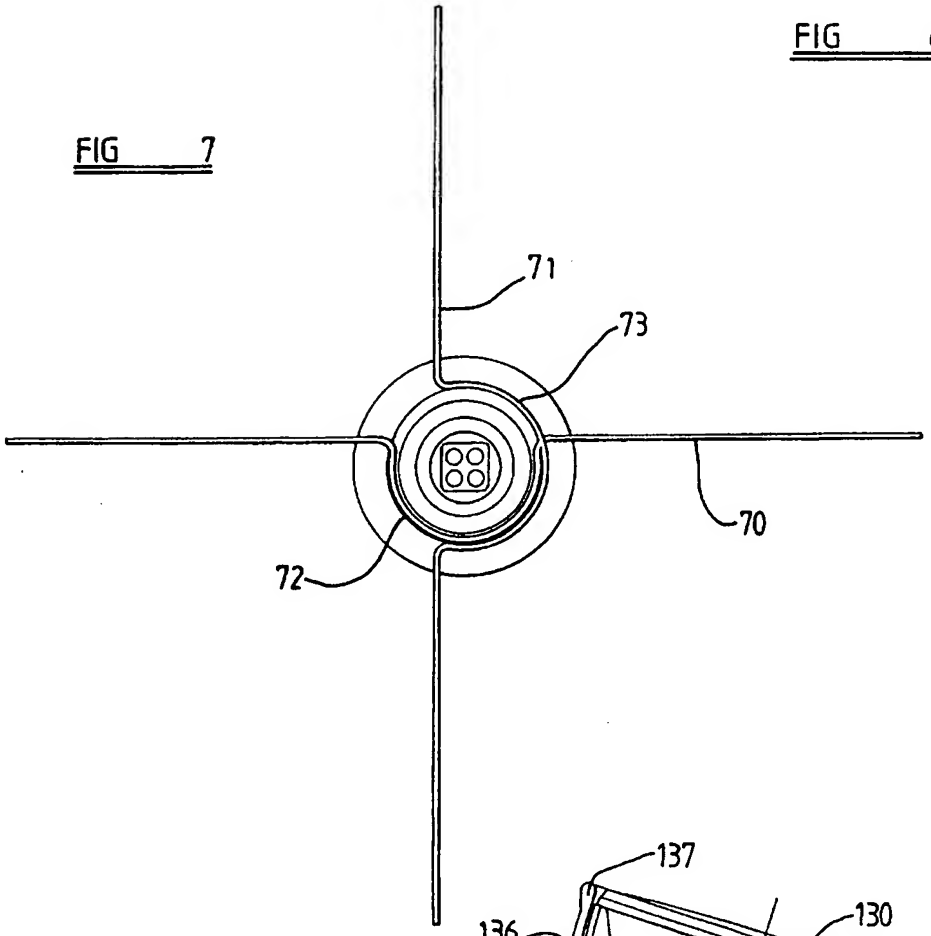


FIG 6

FIG 7



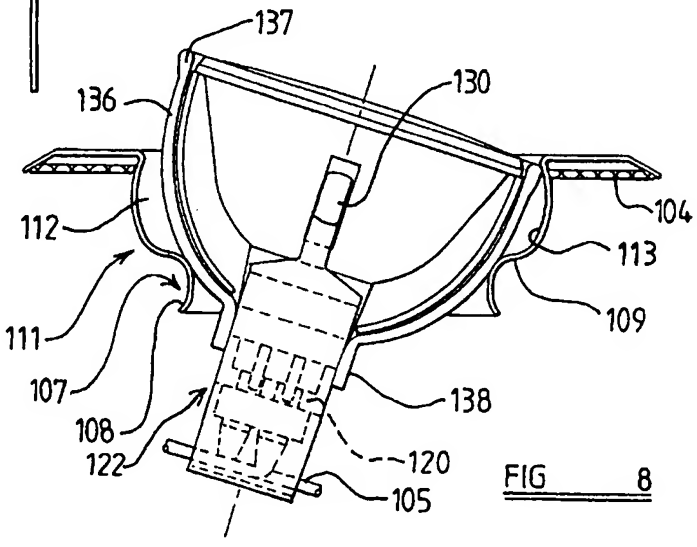


FIG 8

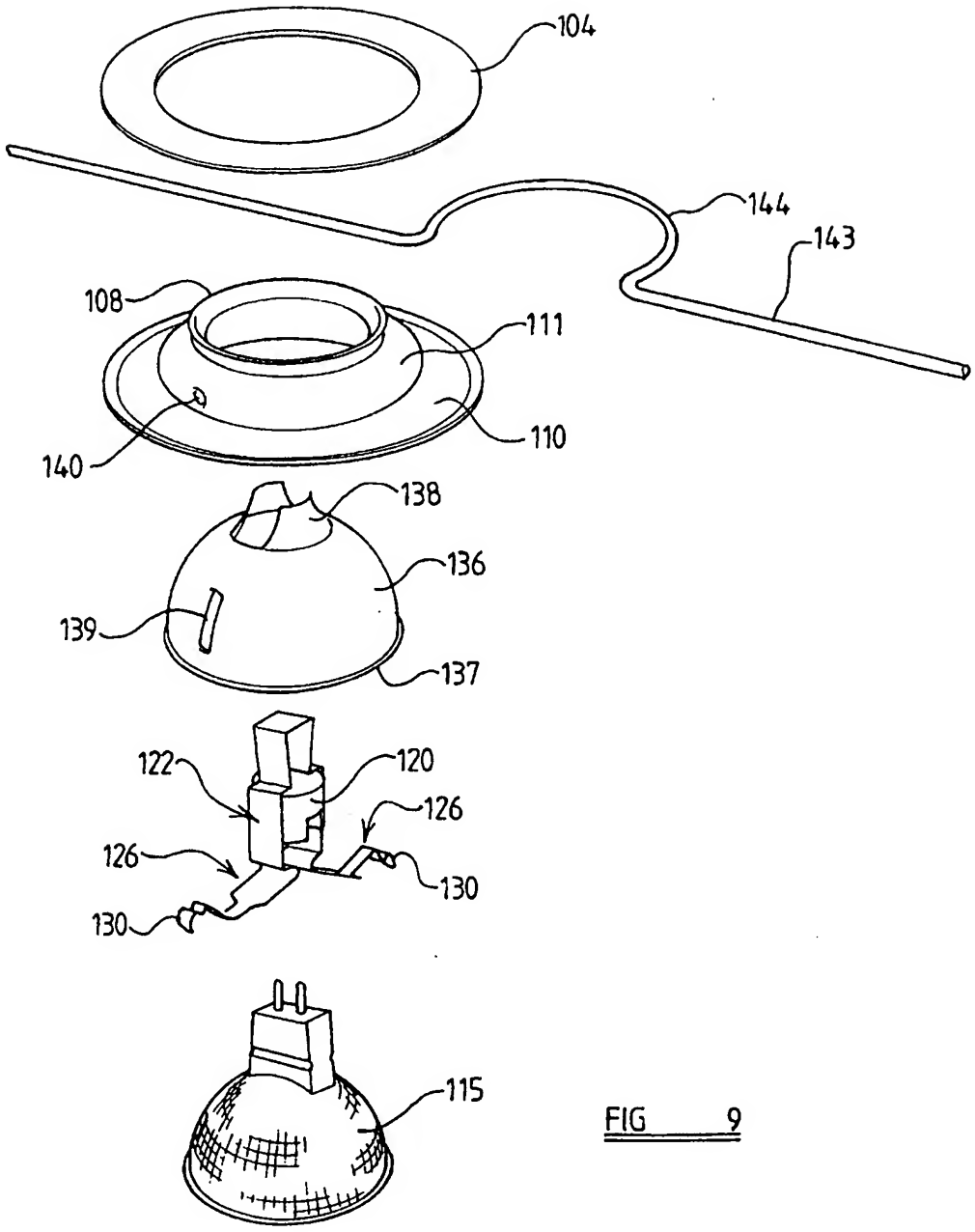

104
144
143
108
111
110
140
138
136
139
137
122
120
126
126
130
130
115

FIG 9

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 97/02548

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 F21V21/04 F21V29/00 F21V25/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 F21V F21S

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2 610 816 A (VOTE) 16 September 1952 see column 1, line 34 - line 43 see column 2, line 46 - column 3, line 25 see figures 1-3	1-10, 21-24,26
Y	---	11-16,25
X	US 4 114 327 A (WILLIAMS) 19 September 1978 see column 3, line 11 - line 48 see figures 1,2	1-8, 21-24,26
Y	---	11-16,25
	DE 92 07 069 U (ADELMANN LICHTCONCEPT GMBH) 17 September 1992 see page 3, line 12 - page 4, line 7 see figure 1	

	-/--	

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 December 1997	18/12/1997

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	De Mas, A

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 97/02548

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 754 377 A (WENMAN) 28 June 1988 see column 4, line 7 - line 28 see column 4, line 57 - column 5, line 14 see column 5, line 53 - line 58 see figures 1-6	11-16,25
A	FR 2 638 817 A (SOCIETE EUROPHANE) 11 May 1990 see page 4, line 23 - line 32 see figures 1,2	17-20
A	GB 2 297 609 A (ENVIRONMENTAL SEALS LTD.) 7 August 1996 see abstract	16,26

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/GB 97/02548

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2610816 A	16-09-52	NONE	
US 4114327 A	19-09-78	NONE	
DE 9207069 U	17-09-92	NONE	
US 4754377 A	28-06-88	NONE	
FR 2638817 A	11-05-90	NONE	
GB 2297609 A	07-08-96	AU 3812495 A	14-08-96
		EP 0805903 A	12-11-97
		WO 9623113 A	01-08-96
		ZA 9509774 A	29-05-96